

What is Claimed Is:

1. A catheter system comprising:
  - an elongated, flexible, hollow outer tubular member having a distal end and a proximal end;
  - an elongated, flexible, inner tubular member having a distal end and a proximal end;
  - said inner tubular member disposed within said outer tubular member such that a fluid channel having a fluid channel length is defined between the inner and outer tubular members;
  - a stent mounting location located near said distal ends of said inner and outer tubular members;
  - at least one spacer disposed within said fluid channel between said inner tubular member and said outer tubular member for maintaining a spacing between said inner tubular member and said outer tubular member, said spacer longitudinally traversing at least 10 percent of said fluid channel length; and
  - an admission port in fluid communication with said fluid channel.
2. The catheter system according to claim 1, wherein said spacer is a longitudinal spacer extending a majority of a length from said proximal end to said distal end of said inner and outer tubular members.
3. The catheter system according to claim 1, wherein said spacer is a continuous longitudinal extension traversing a majority of a length from said proximal end to said distal end of said inner and outer tubular members.
4. The catheter system according to claim 1, wherein said spacer traverses at least 25 percent of said fluid channel length.

5. The catheter system according to claim 1, wherein said spacer traverses at least 50 percent of said fluid channel length.
6. The catheter system according to claim 1, wherein said spacer traverses at least 75 percent of said fluid channel length.
7. The catheter system according to claim 1, wherein said spacer traverses a majority of said fluid channel length.
8. The catheter system according to claim 1, wherein said spacer is disposed to centrally position said inner tubular member within said outer tubular member.
9. The catheter system according to claim 1, wherein said spacer is disposed to maintain said inner tubular member in an offset position within said outer tubular member.
10. The catheter system according to claim 1, wherein said spacer is a spline elongated in a direction along a length of the catheter system.
11. The catheter system according to claim 10, wherein said catheter system includes a plurality of splines elongated along the length of the catheter system.
12. The catheter system according to claim 11, wherein said splines couple to said outer tubular member and project inwardly towards said inner tubular member.
13. The catheter system according to claim 11, wherein said splines couple to said inner tubular member and project outwardly towards said outer tubular member.

14. The catheter system according to claim 1, wherein said spacer includes a plurality of radial, spaced-apart spacer members that extend longitudinally along said fluid channel.

15. The catheter system according to claim 1, wherein said spacer comprises at least one helical spacer extending along a length of said fluid channel.

16. The catheter system according to claim 15, wherein said helical spacer is coupled to said inner tubular member and projects radially outward from said inner tubular member.

17. The catheter system according to claim 1, wherein said spacer includes at least one thermal bonding surface to fixedly couple said inner tubular member and said outer tubular member.

18. The catheter system according to claim 17, wherein said bonding surface is located adjacent the distal end of said outer tubular member.

19. The catheter system according to claim 1, wherein said inner tubular member is hollow to track over a guide wire.

20. The catheter system according to claim 1, including a discharge opening in fluid communication with said fluid channel, the discharge opening being located near said distal end of said outer tubular member.

21. The catheter system according to claim 20, wherein said discharge opening is formed in said outer tubular member to permit fluid flow from said fluid channel to a patient's lumen.

22. The catheter system according to claim 1, wherein said stent mounting location comprises a balloon arrangement for balloon stent delivery, said balloon arrangement being in fluid communication with said fluid channel.
23. The catheter system according to claim 1, wherein said stent mounting location comprises a self-expanding stent arrangement for self-expanding stent delivery, said stent being exposed by axially retracting said outer tubular member relative to said inner tubular member.
24. A balloon catheter system, comprising:
- an elongated, flexible, hollow outer tubular member having a distal end and a proximal end;
  - an elongated, flexible, inner tubular member having a distal end and a proximal end;
  - said inner tubular member disposed within said outer tubular member such that a fluid channel having a fluid channel length is defined between the inner and outer tubular members;
  - at least one spacer disposed within said fluid channel between said inner tubular member and said outer tubular member for maintaining a spacing between said inner tubular member and said outer tubular member, said spacer longitudinally traversing at least 10 percent of said fluid channel length;
  - an admission port in fluid communication with said fluid channel; and
  - an expandable balloon arrangement located near said distal ends of said inner and outer tubular members, said expandable balloon arrangement being in fluid communication with said fluid channel.
25. A stent delivery system, comprising:
- an outer tubular member having a distal end and a proximal end;
  - an inner tubular member having a distal end and a proximal end;

said inner tubular member disposed within said outer tubular member defining a passageway therebetween;  
a stent positioned proximate said distal end of said inner tube;  
an admission port in fluid communication with said passageway; and  
at least one fluid exchange aperture adjacent said distal end of said outer tubular member to deliver a media from said passageway to a patient's body lumen, the fluid exchange aperture being located distal to a longitudinal mid-point of the stent.

26. The stent delivery system of claim 25, wherein the fluid exchange aperture extends radially through the outer tubular member.
27. The stent delivery system of claim 25, wherein the stent delivery systems includes a plurality of fluid exchange apertures, including at least a first fluid exchange aperture and a second fluid exchange aperture, said first and second fluid exchange apertures being positioned adjacent to opposite ends of said stent.
28. The stent delivery system of claim 25, wherein the stent is a self-expanding stent.
29. The stent delivery system of claim 28, wherein the self-expanding stent is exposed by slidably retracting said outer tubular member relative to said inner tubular member.
30. The stent delivery system of claim 25, further including a pressure measuring device for measuring fluid pressure within the passageway.
31. The stent delivery system of claim 25, wherein the outer tubular member includes a sheath portion for covering the stent, and wherein the sheath portion defines at least one fluid exchange aperture.

32. A stent delivery system, comprising:
- (a) a stent;
  - (b) a catheter including a stent mounting location at which the stent is mounted:
    - (i) the catheter further including a retractable sheath for covering the stent;
    - (ii) the catheter defining a fluid exchange passageway, the fluid exchange passageway including a fluid exchange openings that opens to an exterior of the catheter, the fluid exchange openings being located near proximal and distal ends of the stent mounting location.